T082h0" 6h5hth860

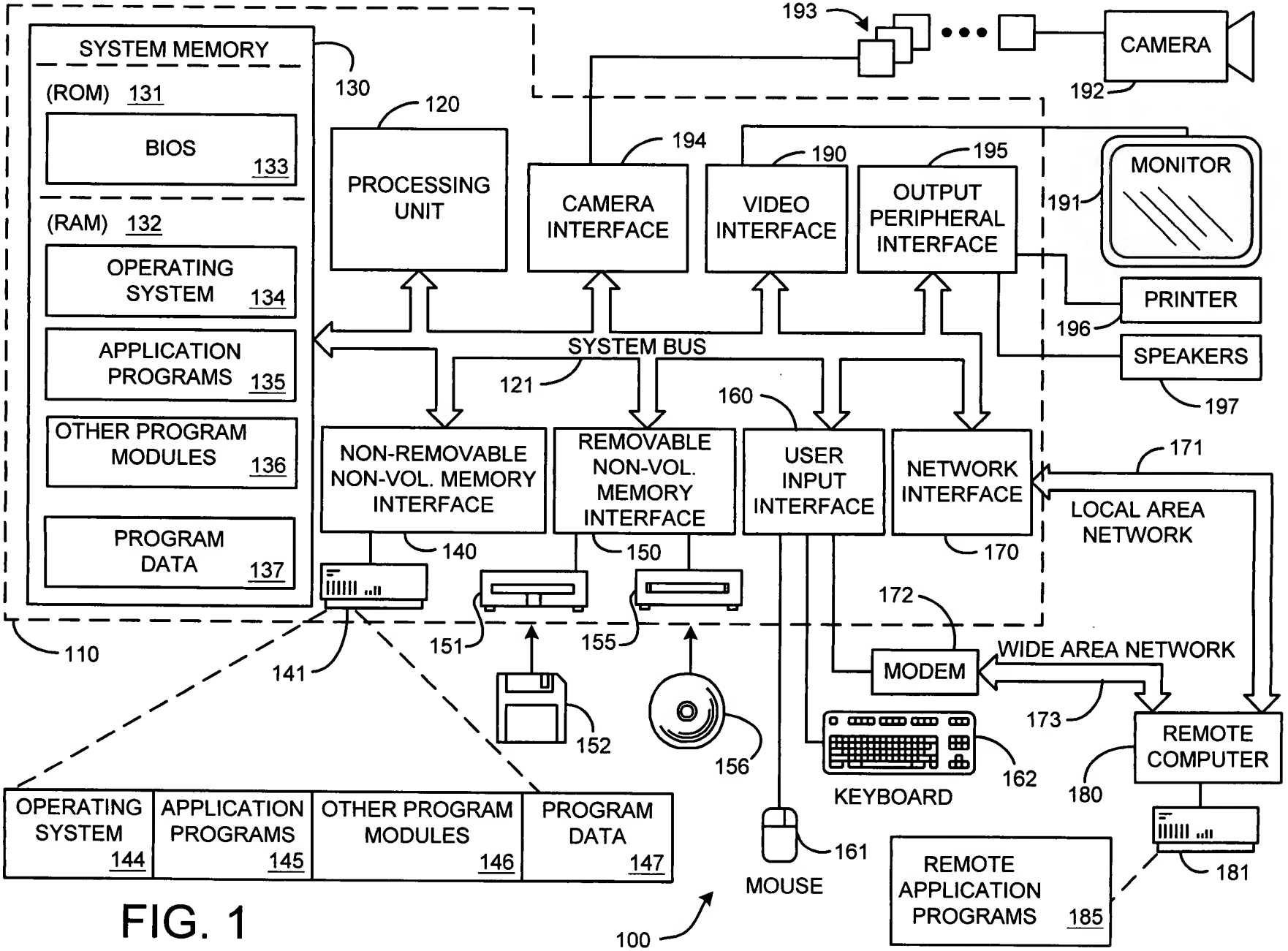

FIG. 1

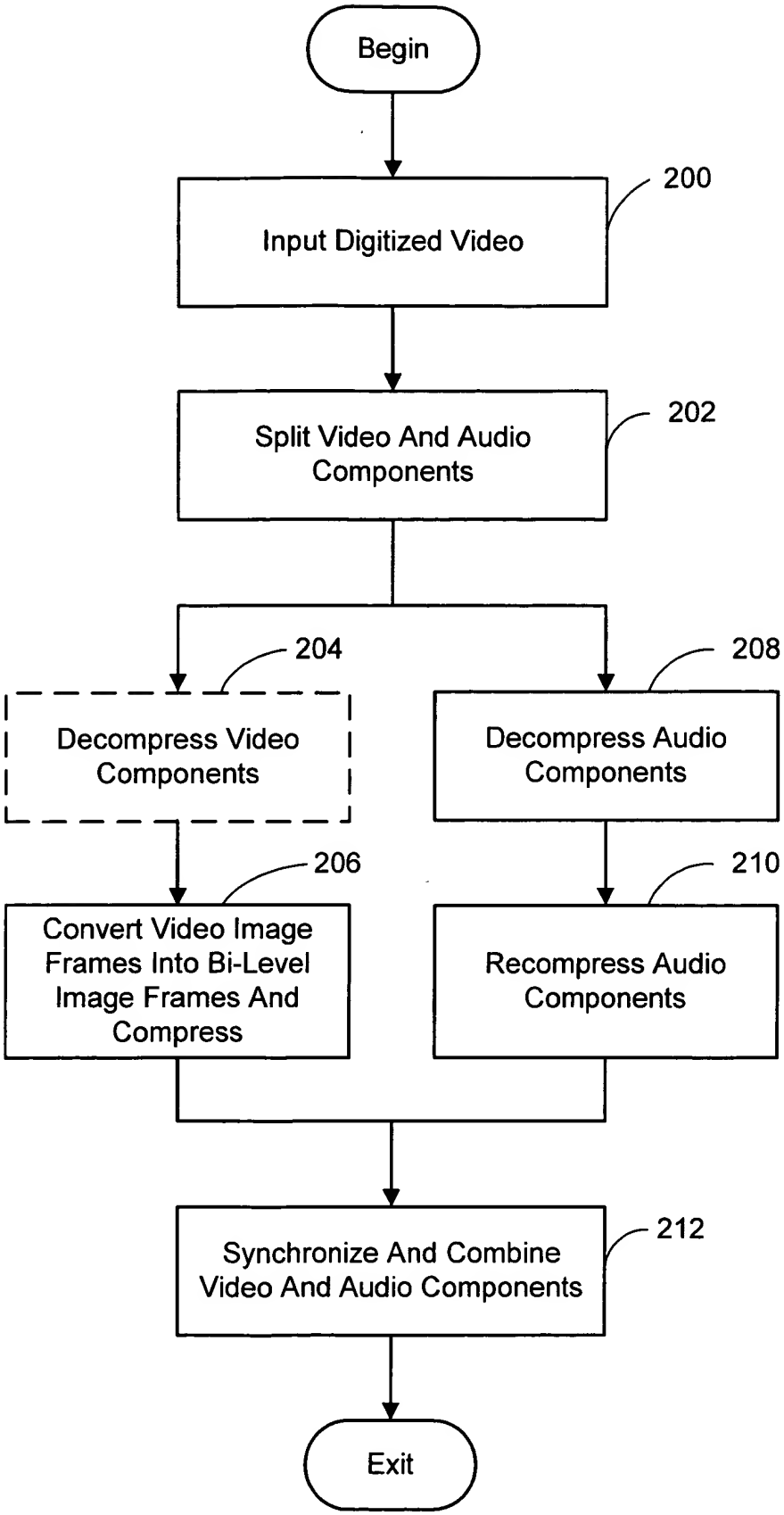
Begin
Input Digitized Video
200
Split Video And Audio Components
202
204
208
Decompress Video Components
Decompress Audio Components
206
210
Convert Video Image Frames Into Bi-Level Image Frames And Compress
Recompress Audio Components
Synchronize And Combine Video And Audio Components
212
Exit

FIG. 2

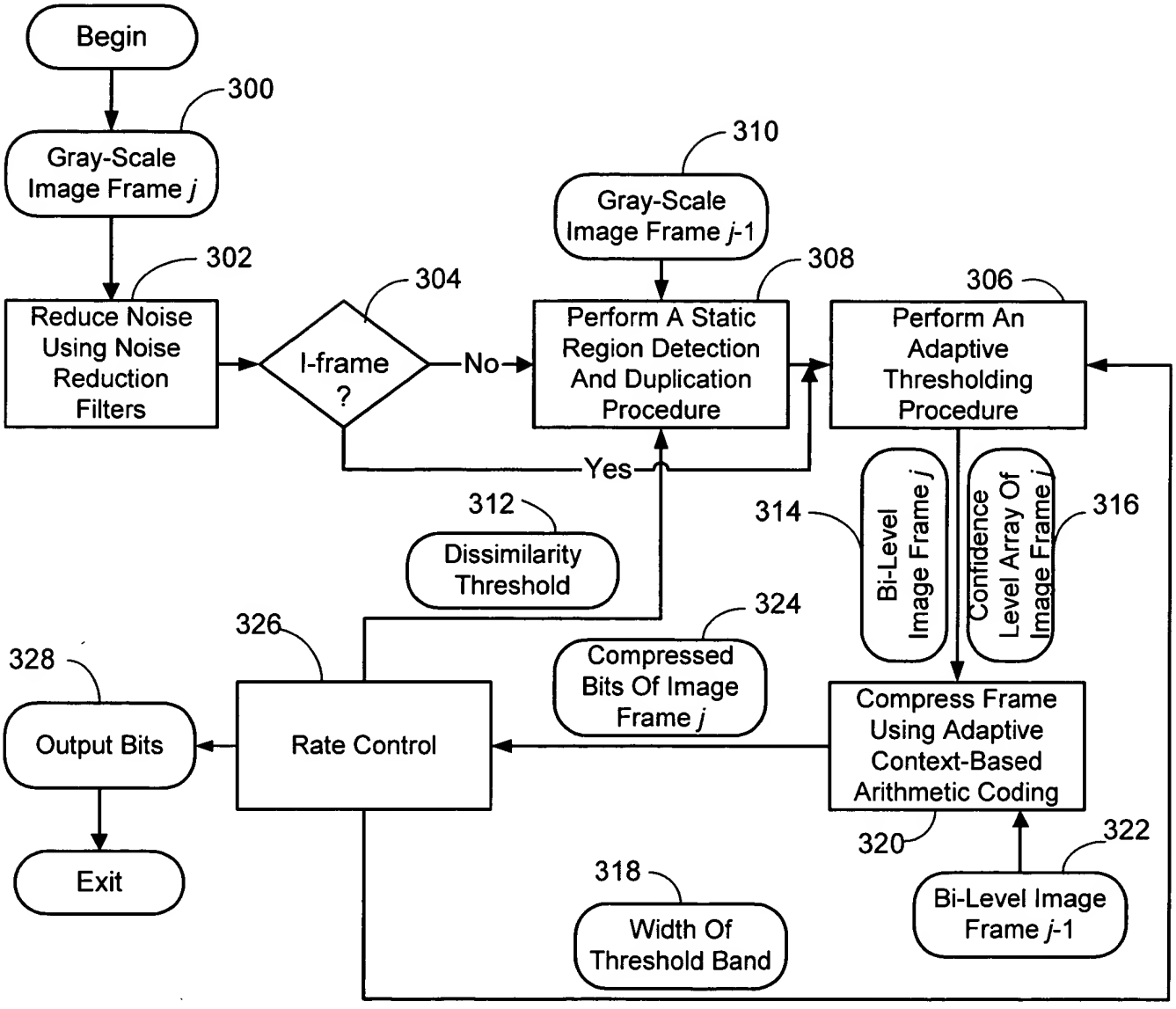
Begin
300
Gray-Scale Image Frame j
302
Reduce Noise Using Noise Reduction Filters
304
I-frame ?
No
Yes
310
Gray-Scale Image Frame j-1
308
Perform A Static Region Detection And Duplication Procedure
306
Perform An Adaptive Thresholding Procedure
312
Dissimilarity Threshold
314
Bi-Level Image Frame j
316
Confidence Level Array Of Image Frame j
324
Compressed Bits Of Image Frame j
326
328
Output Bits
Rate Control
Compress Frame Using Adaptive Context-Based Arithmetic Coding
320
322
Bi-Level Image Frame j-1
Exit
318
Width Of Threshold Band

FIG. 3

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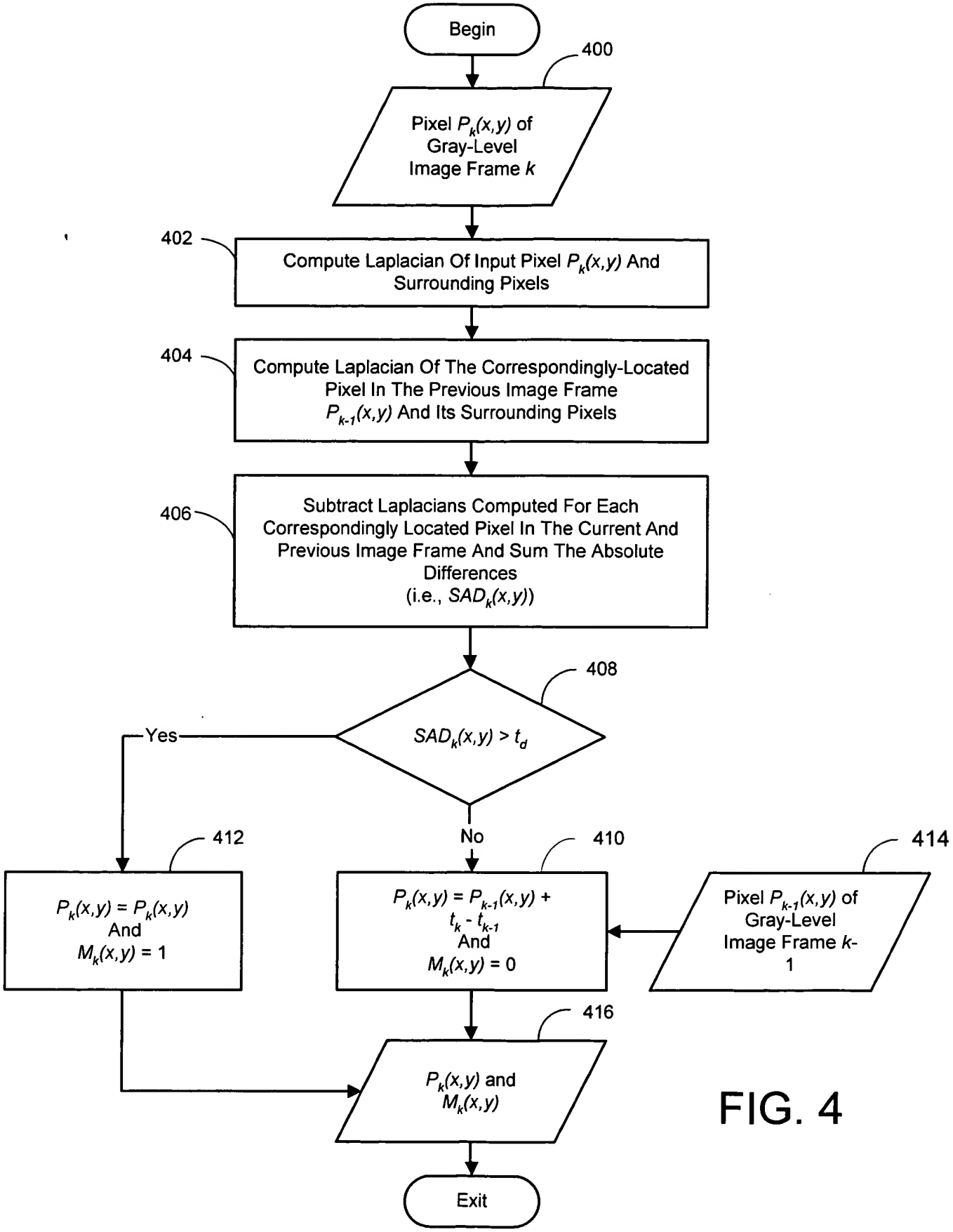

FIG. 4

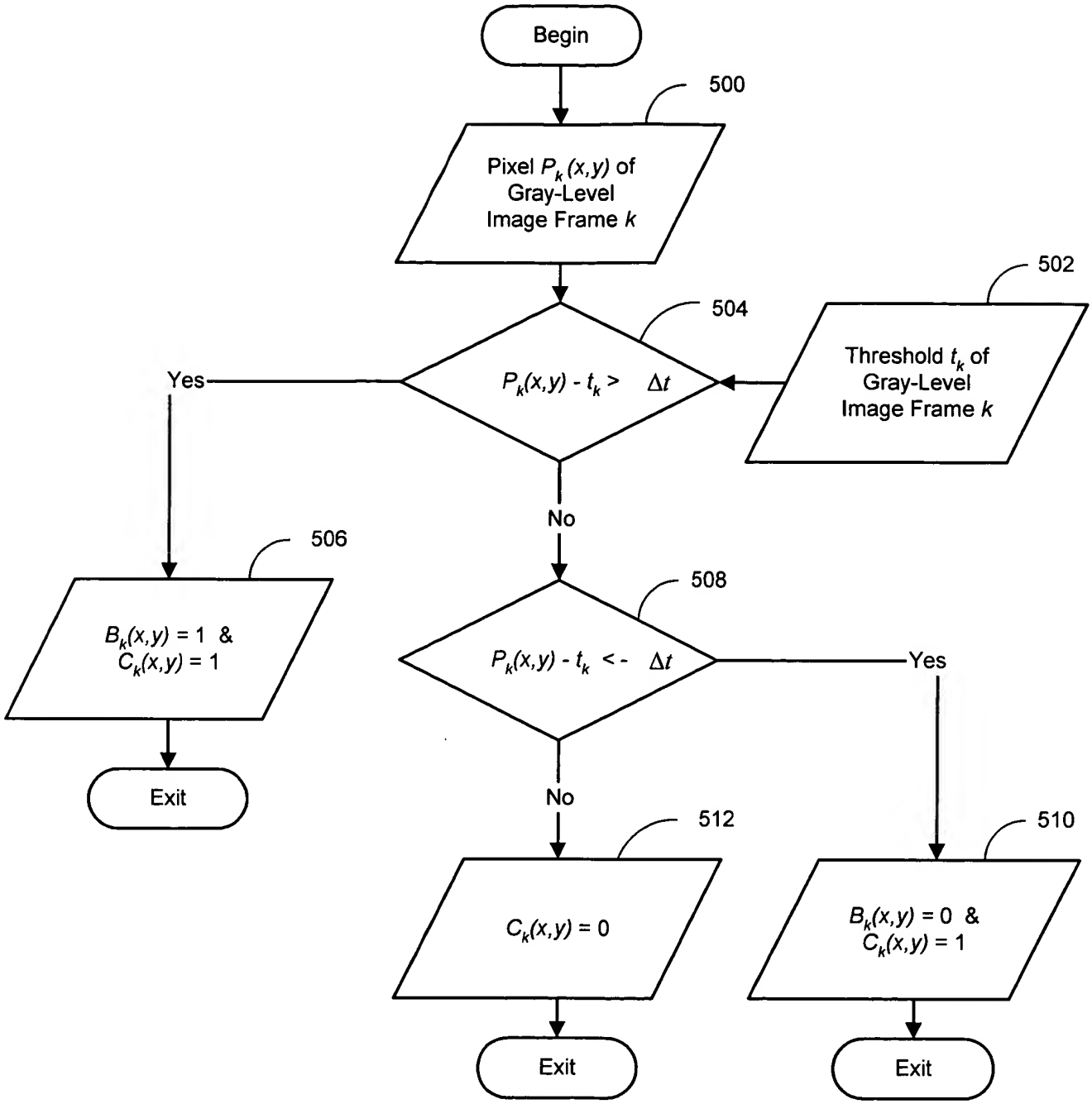
Begin
500
Pixel $P_k(x,y)$ of Gray-Level Image Frame k
502
Threshold t_k of Gray-Level Image Frame k
504
$P_k(x,y) - t_k > \Delta t$
Yes
No
506
$B_k(x,y) = 1$ & $C_k(x,y) = 1$
Exit
508
$P_k(x,y) - t_k < -\Delta t$
Yes
No
510
$B_k(x,y) = 0$ & $C_k(x,y) = 1$
Exit
512
$C_k(x,y) = 0$
Exit

FIG. 5

EC9824D-64544950

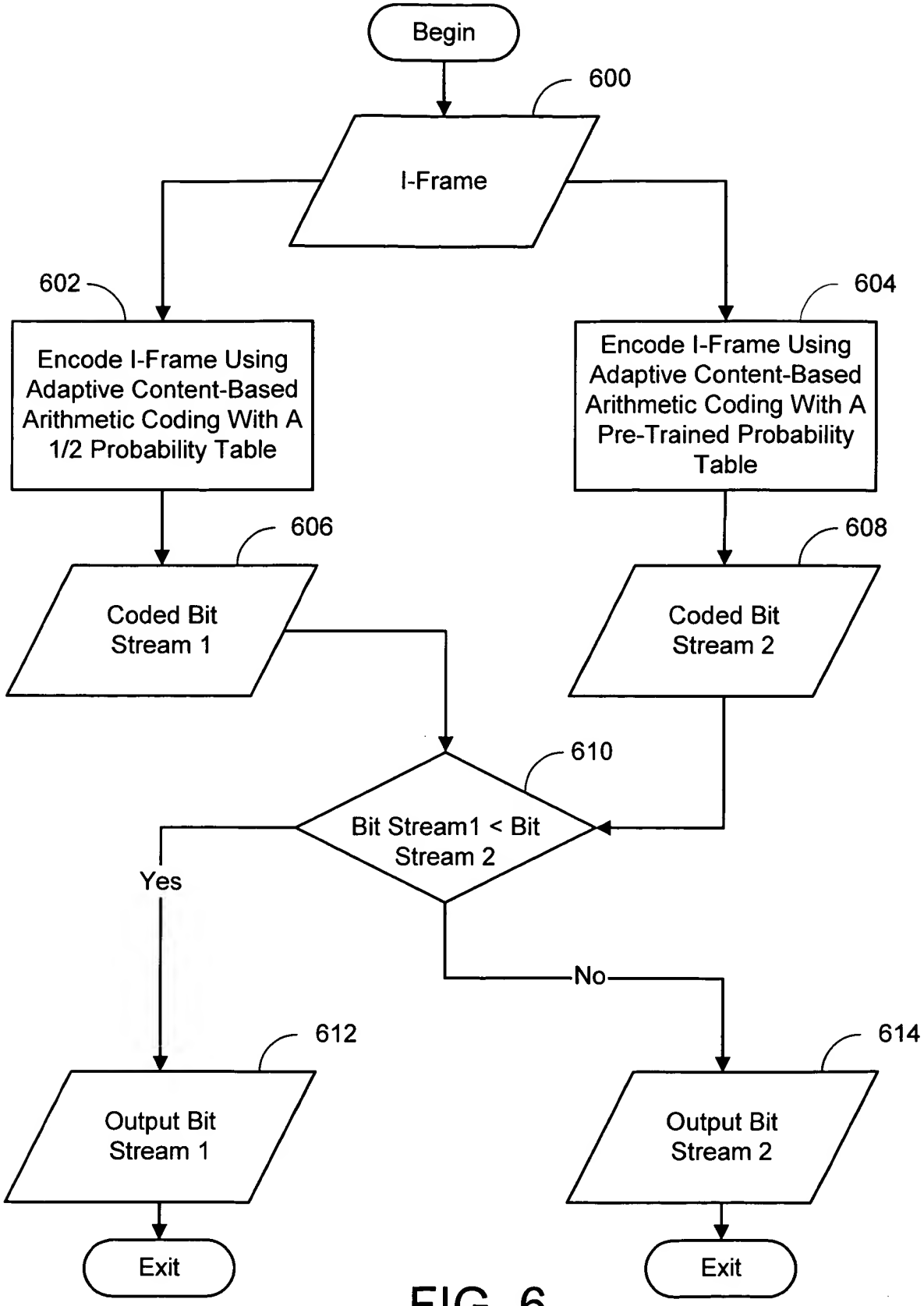

FIG. 6

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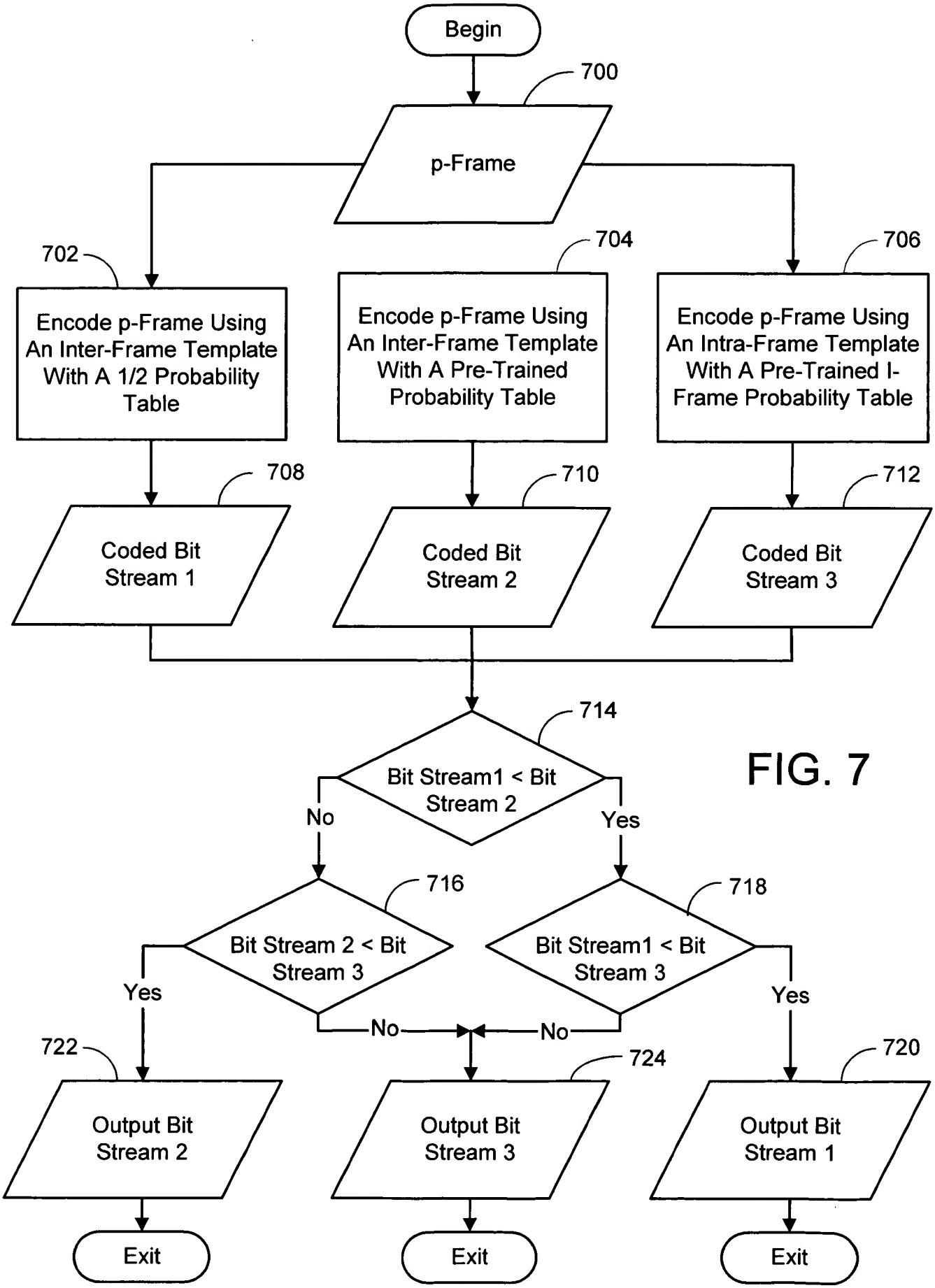

FIG. 7

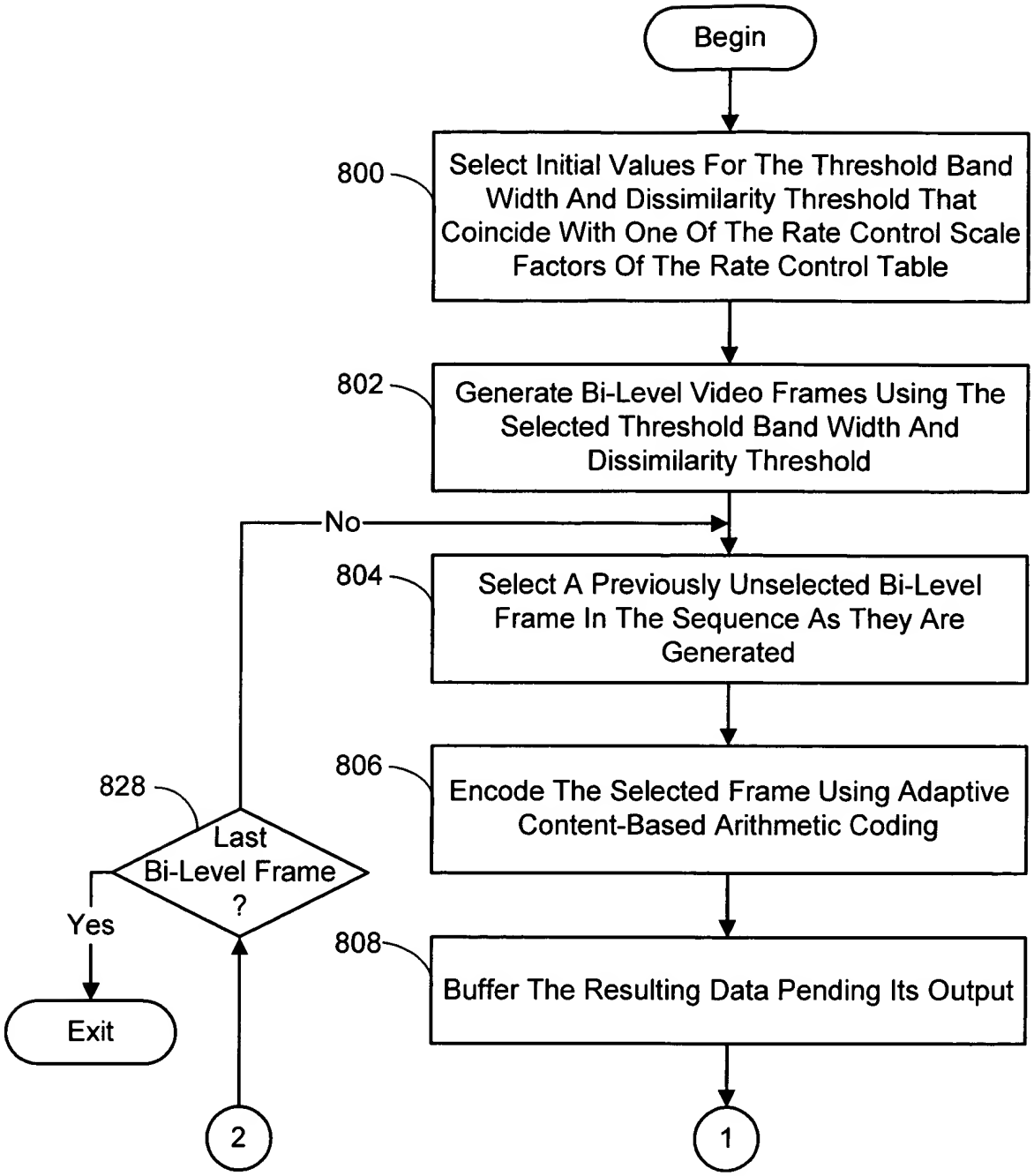
Begin
800
Select Initial Values For The Threshold Band Width And Dissimilarity Threshold That Coincide With One Of The Rate Control Scale Factors Of The Rate Control Table
802
Generate Bi-Level Video Frames Using The Selected Threshold Band Width And Dissimilarity Threshold
No
804
Select A Previously Unselected Bi-Level Frame In The Sequence As They Are Generated
806
Encode The Selected Frame Using Adaptive Content-Based Arithmetic Coding
808
Buffer The Resulting Data Pending Its Output
828
Last Bi-Level Frame ?
Yes
Exit
2
1

FIG. 8A

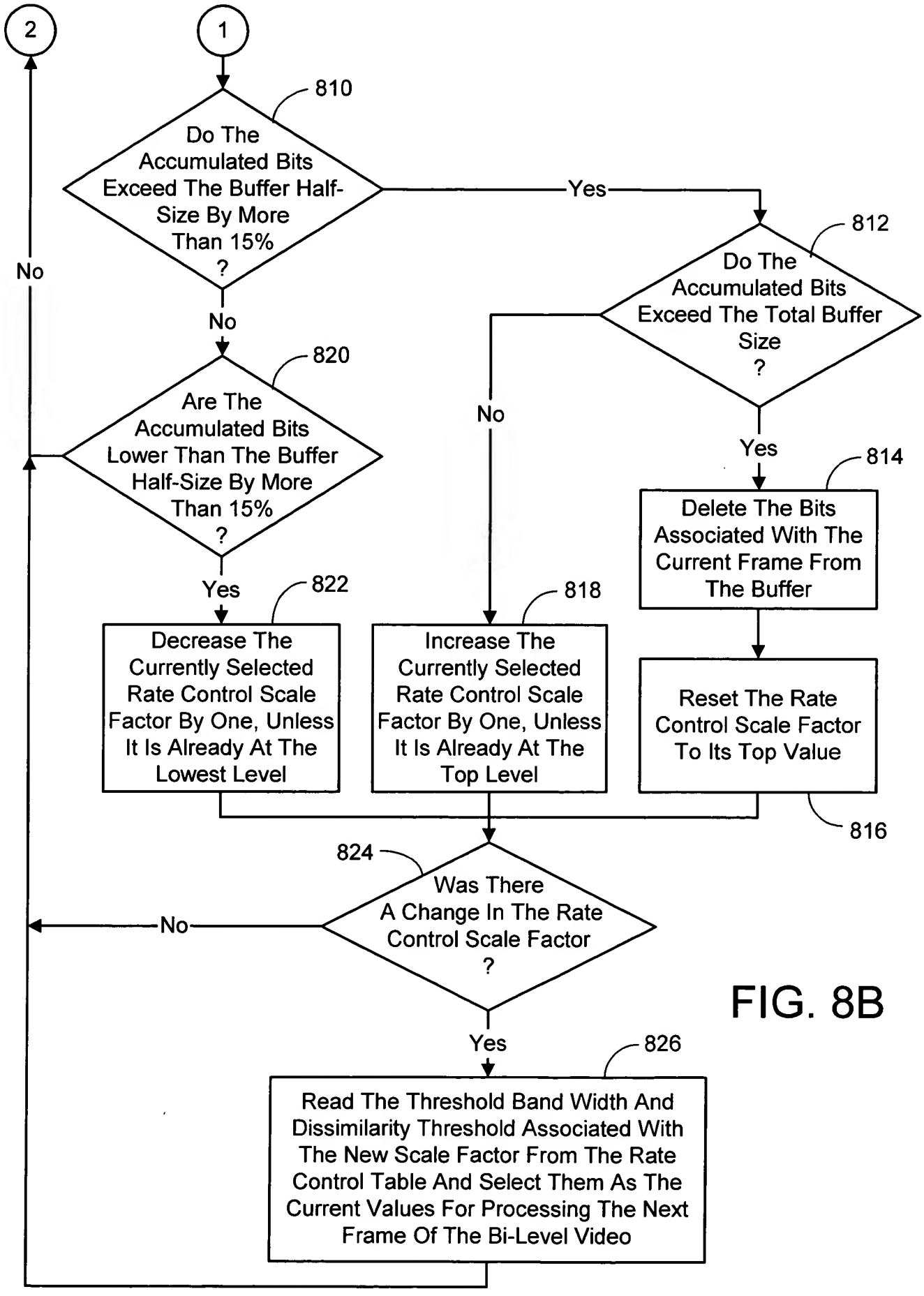
2
1
810
Do The Accumulated Bits Exceed The Buffer Half-Size By More Than 15% ?
Yes
No
812
Do The Accumulated Bits Exceed The Total Buffer Size ?
No
Yes
814
Delete The Bits Associated With The Current Frame From The Buffer
Reset The Rate Control Scale Factor To Its Top Value
816
820
Are The Accumulated Bits Lower Than The Buffer Half-Size By More Than 15% ?
No
Yes
822
Decrease The Currently Selected Rate Control Scale Factor By One, Unless It Is Already At The Lowest Level
818
Increase The Currently Selected Rate Control Scale Factor By One, Unless It Is Already At The Top Level
824
Was There A Change In The Rate Control Scale Factor ?
No
Yes
826
Read The Threshold Band Width And Dissimilarity Threshold Associated With The New Scale Factor From The Rate Control Table And Select Them As The Current Values For Processing The Next Frame Of The Bi-Level Video

FIG. 8B

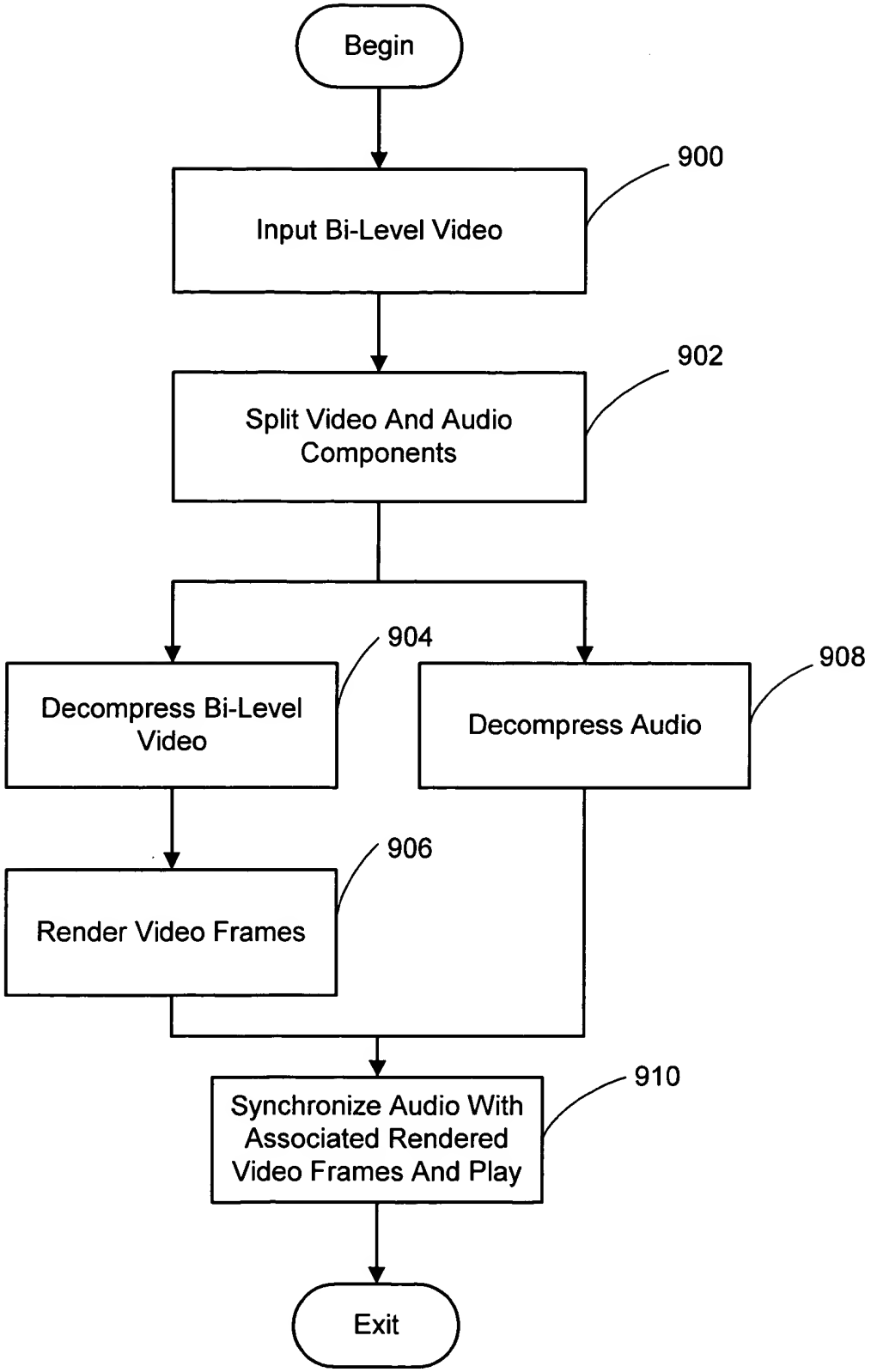
Begin
900
Input Bi-Level Video
902
Split Video And Audio Components
904
Decompress Bi-Level Video
908
Decompress Audio
906
Render Video Frames
910
Synchronize Audio With Associated Rendered Video Frames And Play
Exit

FIG. 9

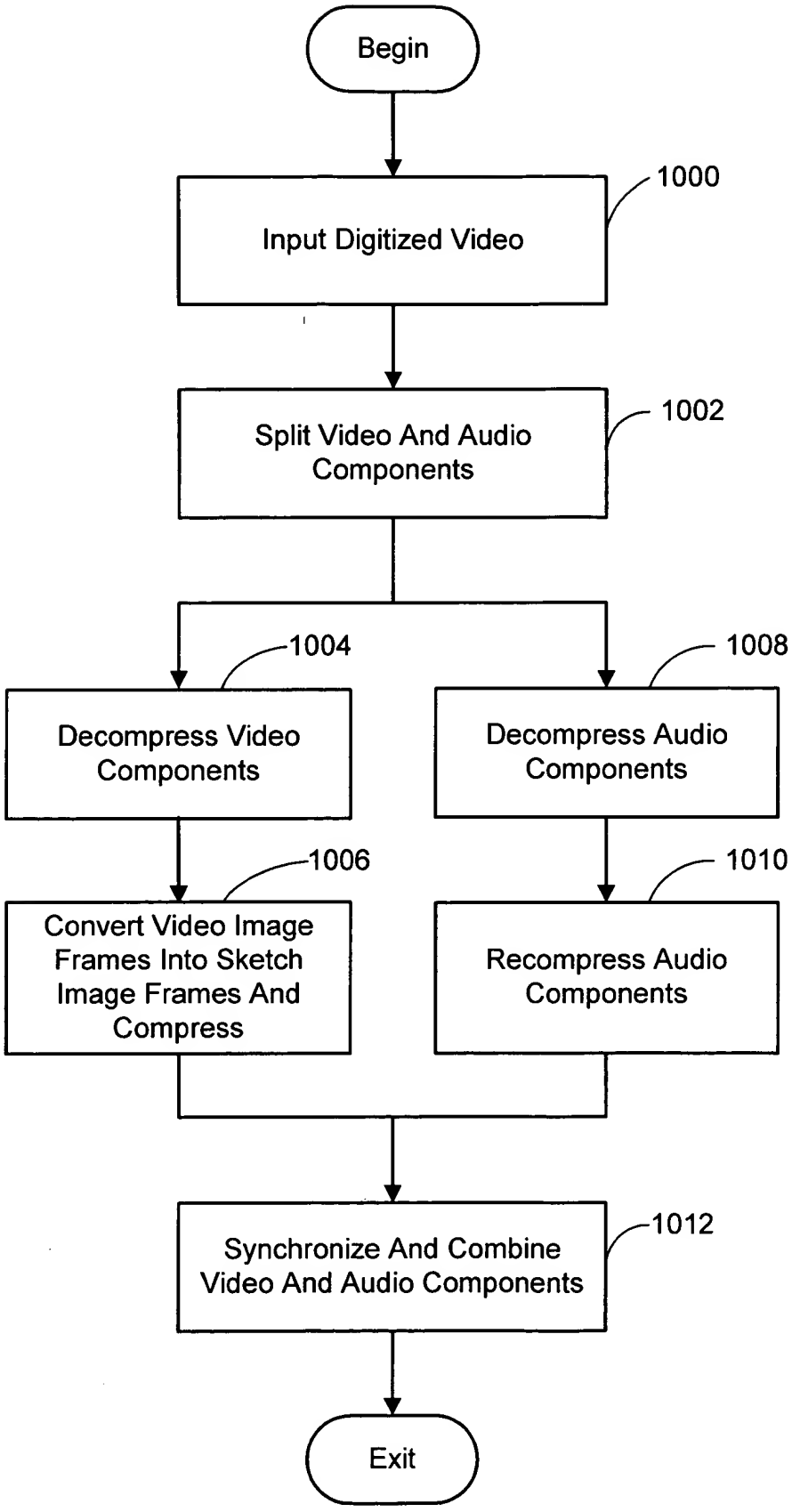
Begin
1000
Input Digitized Video
1002
Split Video And Audio Components
1004
Decompress Video Components
1008
Decompress Audio Components
1006
Convert Video Image Frames Into Sketch Image Frames And Compress
1010
Recompress Audio Components
1012
Synchronize And Combine Video And Audio Components
Exit

FIG. 10

1P6824.0494549.0

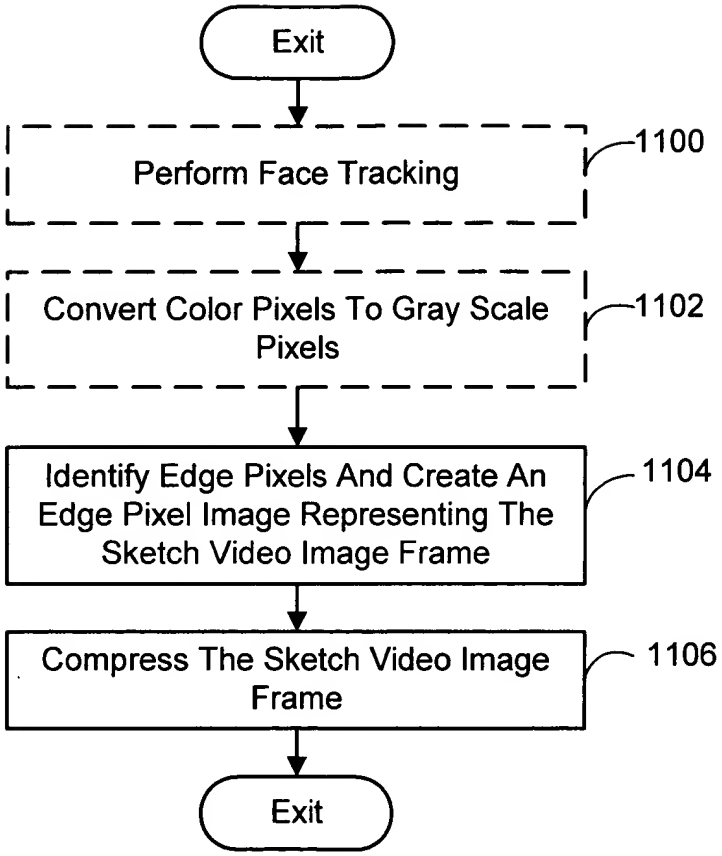

FIG. 11

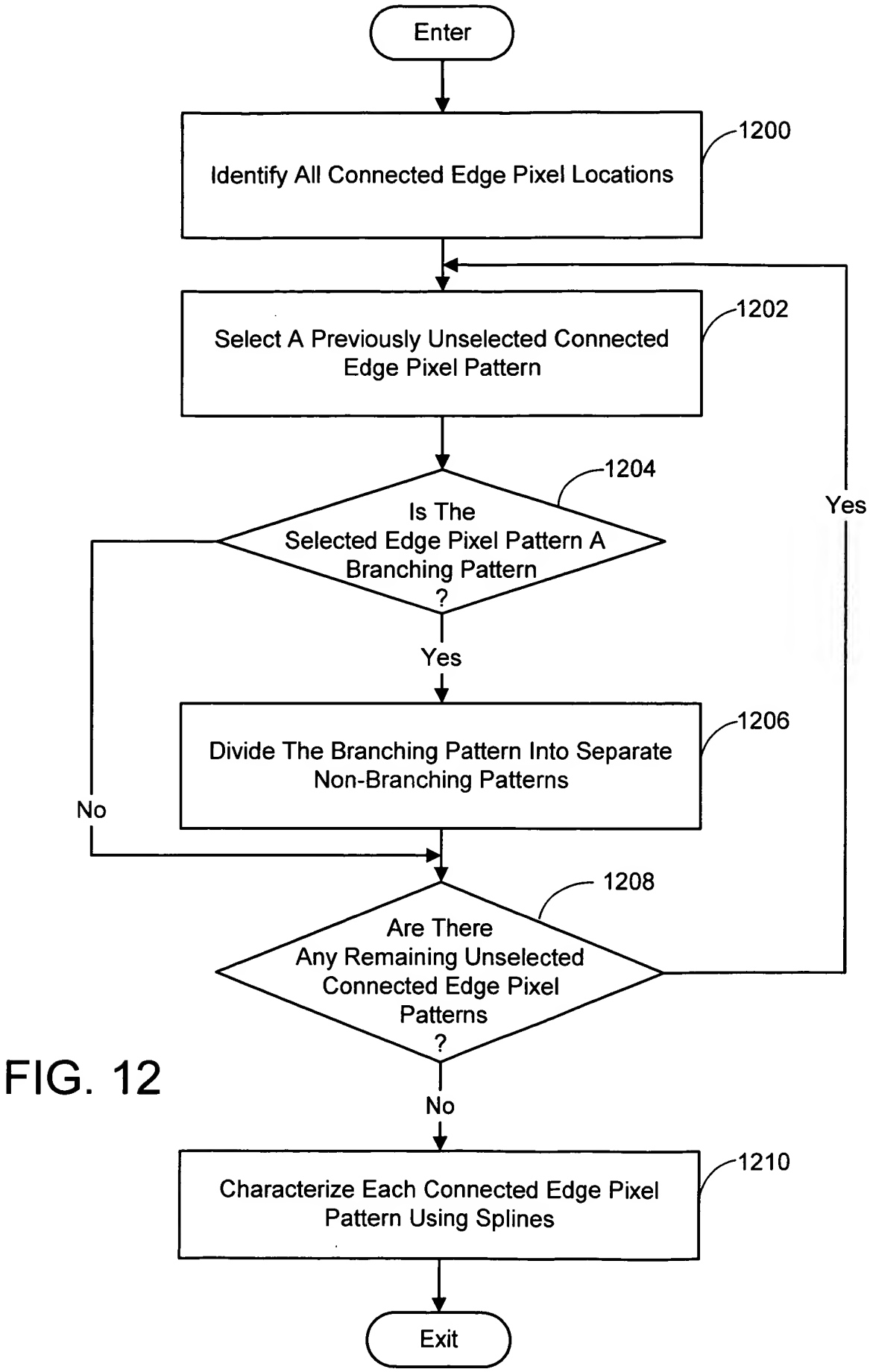

FIG. 12

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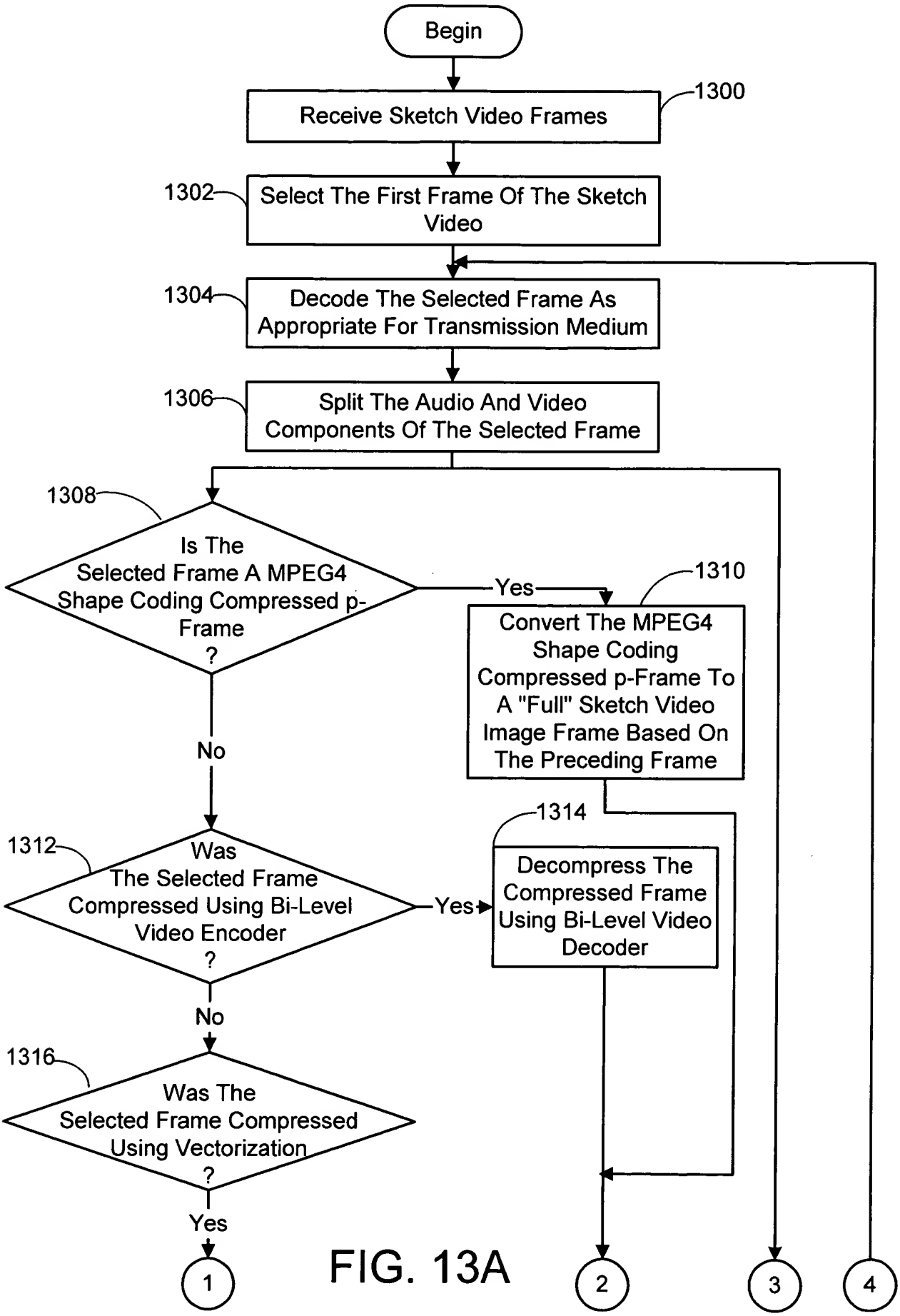
Begin
Receive Sketch Video Frames
1300
1302
Select The First Frame Of The Sketch Video
1304
Decode The Selected Frame As Appropriate For Transmission Medium
1306
Split The Audio And Video Components Of The Selected Frame
1308
Is The Selected Frame A MPEG4 Shape Coding Compressed p-Frame ?
Yes
1310
Convert The MPEG4 Shape Coding Compressed p-Frame To A "Full" Sketch Video Image Frame Based On The Preceding Frame
No
1312
Was The Selected Frame Compressed Using Bi-Level Video Encoder ?
Yes
1314
Decompress The Compressed Frame Using Bi-Level Video Decoder
No
1316
Was The Selected Frame Compressed Using Vectorization ?
Yes
1
2
3
4

FIG. 13A

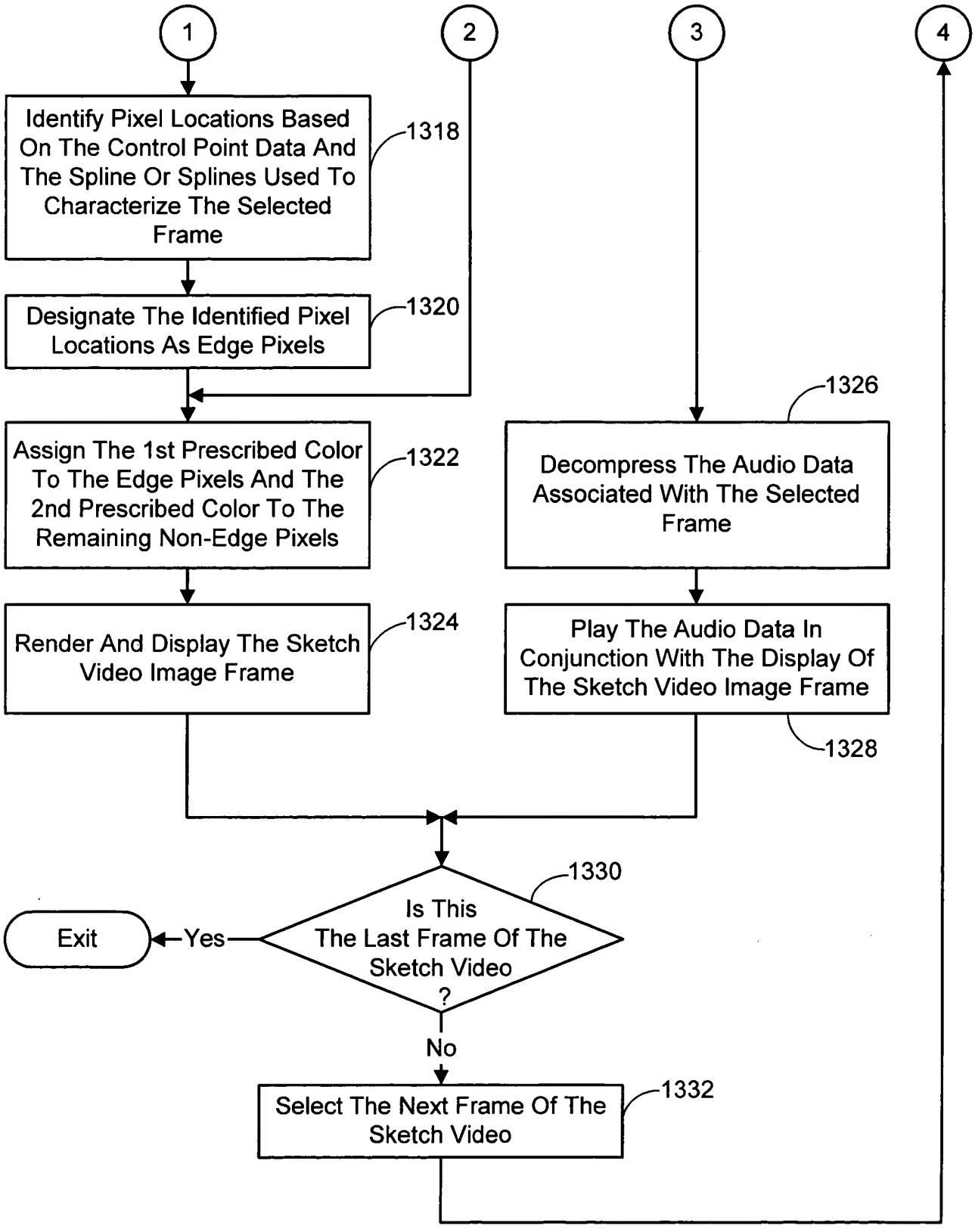
1
2
3
4
Identify Pixel Locations Based On The Control Point Data And The Spline Or Splines Used To Characterize The Selected Frame
1318
Designate The Identified Pixel Locations As Edge Pixels
1320
Assign The 1st Prescribed Color To The Edge Pixels And The 2nd Prescribed Color To The Remaining Non-Edge Pixels
1322
Render And Display The Sketch Video Image Frame
1324
1326
Decompress The Audio Data Associated With The Selected Frame
Play The Audio Data In Conjunction With The Display Of The Sketch Video Image Frame
1328
1330
Is This The Last Frame Of The Sketch Video ?
Yes
Exit
No
Select The Next Frame Of The Sketch Video
1332

FIG. 13B

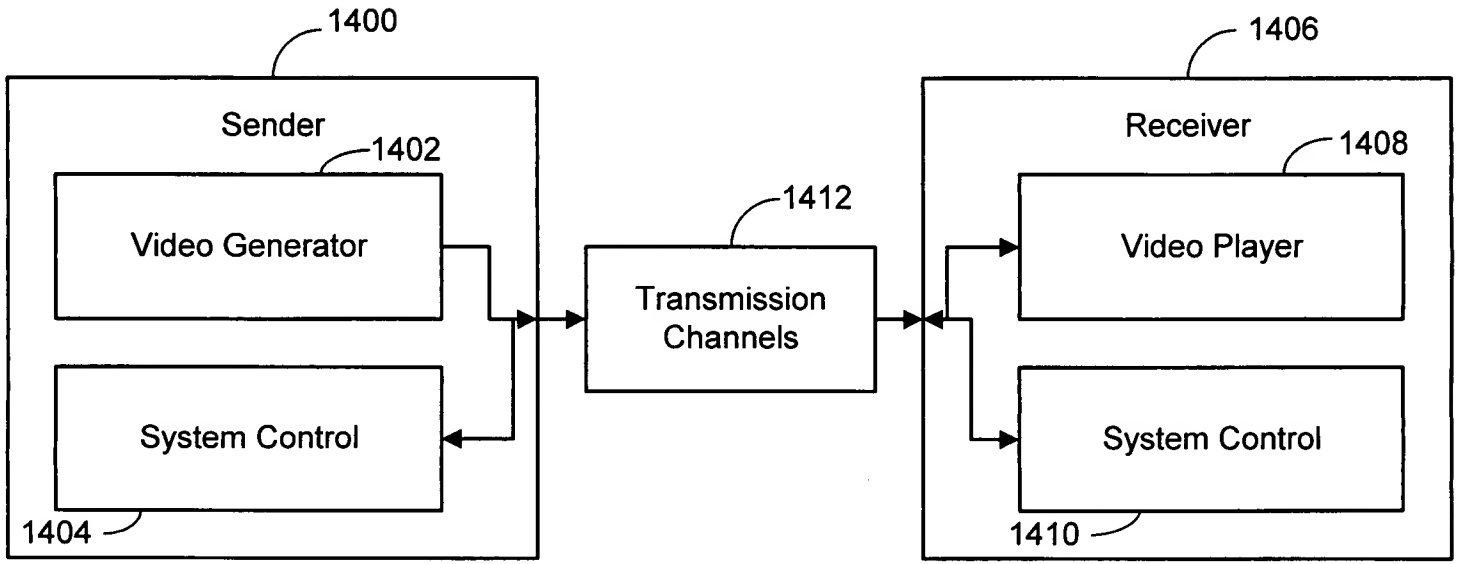
1400
Sender
1402
Video Generator
System Control
1404
1412
Transmission Channels
1406
Receiver
1408
Video Player
System Control
1410

FIG. 14

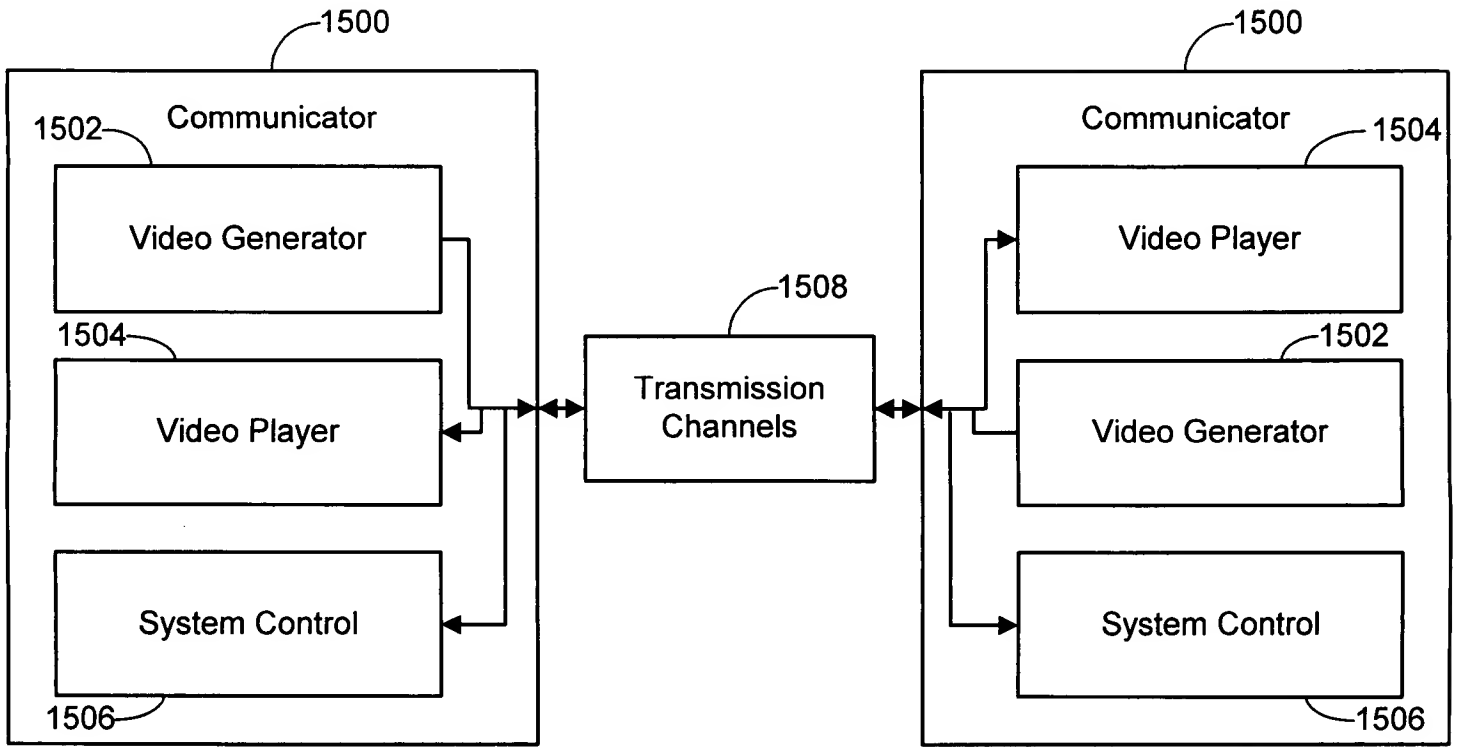
1500
Communicator
1502
Video Generator
1504
Video Player
System Control
1506
1508
Transmission Channels
1500
Communicator
1504
Video Player
1502
Video Generator
System Control
1506

FIG. 15

4,084,250 - 04/25/2008

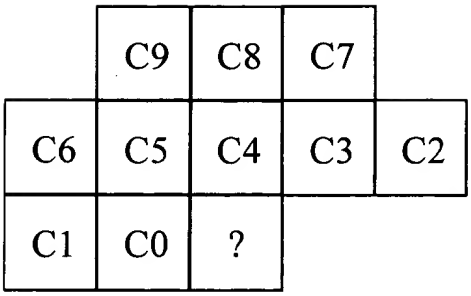

FIG. 16A

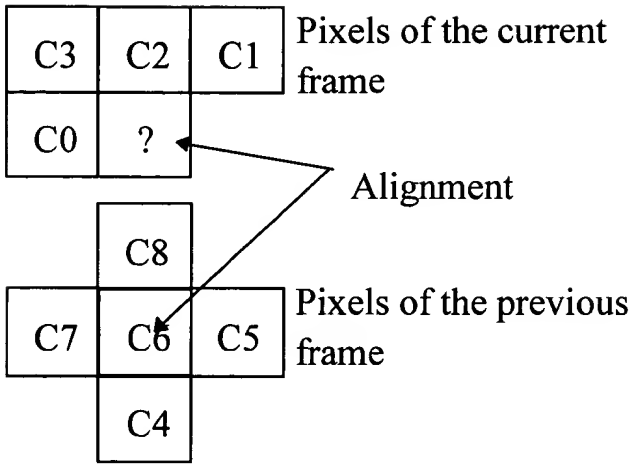

FIG. 16B